and which hybridizes with said sample oligonucleotide sequence and with a probe comprising an oligonucleotide sequence which hybridizes to a target oligonucleotide sequence to be detected in a suitable buffer to form a complex;

(b) subjecting said complex to a field which moves unbound oligonucleotide sequences away from said anchor sequence in the direction of said field, wherein said field is a magnetic field and a magnetic particle is attached to said sample oligonucleotide sequence or said probe or said field is an electric field; and

(c) determining whether said probe is bound to said sample oligonucleotide sequence.

50. The method of claim 49 wherein said probe is labeled with a fluorochrome and determining whether said probe is bound to said sample oligonucleotide sequence is performed by observing the fluorochrome with a fluorescent microscope.

51. The method of claim 50 wherein said fluorochrome is present in a bead.

52. The method of claim 51 wherein said bead is plastic.

53. The method of claim 52 wherein said plastic bead is a polystyrene bead.

54. The method of claim 49 wherein said anchor sequence is from about 10 to about 100 bases.

55. The method of claim 52 wherein said anchor sequence is from about 20 to about 40 bases.

56. The method of claim 49 wherein said complex is subjected to said field for a time sufficient to extend said sample oligonucleotide sequence and the position of said probe in relation to said anchor sequence is also determined.

57. The method of claim 49 additionally comprising subjecting the probe toa field which concentrates the probe near the anchor sequence during step(a).

58. The method of claim 49 wherein said probe is from about 4 to about 100bases.

59. A method for determining whether a first and a second target oligonucleotide sequence are on a molecule of sample DNA comprising:

(a) contacting said sample DNA with an anchor sequence comprising an oligonucleotide sequence which is immobilized to a support and which hybridizes with said first target oligonucleotide sequence and with a probe which hybridizes with said second target oligonucleotide sequence in a suitable buffer to form a complex;

(b) subjecting said complex to an electric field which moves unbound oligonucleotide sequences away from said anchor sequence in the direction of said field; and

(c) determining whether said probe is bound to said sample DNA.

60. The method of claim 59 wherein said sample DNA is not more than about 200 kilobases.

61. The method of claim 59 wherein said sample DNA greater than about 200 kilobases and said sample DNA is prepared by lysing cells in a gel and adding a fragment of said gel to said support.

62. The method of claim 59 wherein said probe is from about 5 to about 15 bases.

63. The method of claim 59 wherein said electric field extends said sample DNA in the direction of said field and the distance between said first and second oligonucleotide sequences is determined by determining the distance between said anchor sequence and said probe.

64. The method of claim 59 wherein hybridization of said sample DNA to said anchor sequence forms a double stranded oligonucleotide sequence having a site recognized by a restriction endonuclease and said restriction endonuclease is present on said solid phase or in said buffer.

65. A method for obtaining a pattern characteristic of sample DNA comprising:

(a) contacting said sample DNA with an anchor sequence comprising an immobilized, conserved oligonucleotide sequence which hybridizes with said sample DNA and with a plurality of probes, each of said probes comprising an

oligonucleotide sequence of from about 5 to about 15 bases in a suitable buffer to form a complex;

(b) subjecting said complex to an electric field which moves unbound oligonucleotide sequences away from said anchor sequence and extends said sample DNA in the direction of said field; and

(c) determining the positions of said probes from said anchor sequence.

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66. The method of claim 65 wherein said probes are from about 7 to about10 bases.

67. The method of claim 65 wherein said probes have identical oligonucleotide sequences.

68. The method of claim 65 wherein the oligonucleotide sequence of said probe is a random sequence.

69. The method of claim 65 wherein said probes have different oligonucleotide sequences and are labeled with different fluorochromes.

70. A method for determining whether sample DNA and test DNA are from the same individual comprising:

(a) contacting said sample DNA and said test DNA with an anchor sequence comprising an immobilized, conserved oligonucleotide sequence which hybridizes

with said test DNA and with a plurality of probes, each of said probes comprising an oligonucleotide sequence of from about 5 to about 15bases in a suitable buffer to form a complex;

(b) subjecting said complex to an electric field which moves unbound oligonucleotide sequences away from said anchor sequence and extends said sample DNA in the direction of said field;

(c) determining the positions of said probes from said anchor sequence for said sample DNA and said test DNA; and

(d) comparing the positions of said probes for said test DNA to said probes for said sample DNA.

71. A method for determining whether a putative father is the father of a child comprising:

(a) contacting said sample DNA from said putative father, said child and the mother of said child with an anchor sequence comprising an immobilized, conserved oligonucleotide sequence which hybridizes with said putative father's DNA and with a plurality of probes, each of said probes comprising an oligonucleotide sequence of from about 5 to about 15 bases in a suitable buffer to form a complex;

(b) subjecting said complex to an electric field which moves unbound oligonucleotide sequences away from said anchor sequence and extends said sample DNA in the direction of said field;

(c) determining the positions of said probes from said anchor sequence for said DNA from said putative father, said child, and said mother;

(d) comparing the positions of said probes for said child's DNA to those of said mother; and

(e) comparing any positions of the probes of said child which do not match with the probes of said mother to said probes of said putative father.

72. A method for determining whether a test oligonucleotide sequence is present in sample oligonucleotide sequence comprising:

(a) contacting said sample oligonucleotide sequence with an anchor sequence comprising an immobilized, conserved oligonucleotide sequence known to hybridize with an oligonucleotide sequence present in said sample oligonucleotide sequence and with a probe comprising an oligonucleotide sequence which binds to said test oligonucleotide sequence in a suitable buffer to form a complex;

(b) subjecting said complex to an electric field which moves unbound oligonucleotide sequences away from said anchor sequence and extends said sample DNA in the direction of said field; and

(c) determining whether said probe is bound to said sample oligonucleotide sequence.

73. The method of claim 72 wherein said sample oligonucleotide sequence is single stranded DNA.

74. The method of claim 72 wherein said sample oligonucleotide sequence is RNA.